

REMARKS/ARGUMENTS

Claims 1-4, 7-11, 13-23, 29-39, 44, and 50-66 were previously pending in the application. Claims 2, 7, 9, 15-17, 23, 29-39, 44, and 50-66 are canceled; claims 1, 8, and 19-22 are amended; and new claims 67-102 are added herein. Assuming the entry of this amendment, claims 1, 3-4, 8, 10-11, 13-14, 18-22, and 67-102 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

The Applicant submits that the cancellation of many of the previously pending claims and the submission of the new claims resulted from the Examiner withdrawing, in the pending office action, the previous indication of certain subject matter as being allowable.

In paragraph 6 of the office action, the Examiner rejected claims 1-4, 7-11, 13-23, 29-35, 38-39, 44, and 50-66 under 35 U.S.C. 103(a) as being unpatentable over Platt in view of Lindemann in further view of Rho in further view of Besserman. In paragraph 7, the Examiner rejected claims 36-37 under 103(a) as being unpatentable over Platt in view of Lindemann. In paragraph 8, the Examiner rejected claims 38-39 under 103(a) as being unpatentable over Platt in view of Lindemann in further view of Rho. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over the cited references.

In paragraph 9, the Examiner objected to claims 29-35, 37-39, 50-60, and 63-65. In response, the Applicant has amended claims as suggested by the Examiner.

Claims 1, 8, and 19-22

Claim 1 has been amended to clarify that the command is sent from the second computer to a digital signal processor in the hearing aid as a DTMF tone. Support for this amendment is found in previously pending (now canceled) claim 2.

In rejecting previously pending claim 2, the Examiner stated that DTMF signaling "is used for telephone signaling over the line in the voice frequency band to the call-switching center." The Examiner appeared to rely on this argument in support of the conclusion that the DTMF signaling in claim 2 was obvious. The Applicant respectfully submits that this argument is improper and the conclusion is incorrect.

The DTMF signaling in currently amended claim 1 is in the opposite direction from that cited by the Examiner. In the Examiner's DTMF signaling, the DTMF signals are transmitted from the telephone to the call-switching center in the upstream direction (i.e., away from the user), while, in claim 1, the DTMF signals are transmitted from the second computer to the hearing aid in the downstream direction (i.e., towards the user). The conventional upstream DTMF signaling of the prior art simply does not obviate the downstream DTMF signaling of claim 1. The Examiner cites no reference that teaches DTMF signaling in the downstream direction, let alone downstream DTMF signaling in the particular context of remote adjustment of a hearing aid.

As such, the Applicant submits that currently allowed claim 1 is allowable over the cited references. For similar reasons, the Applicant submits that currently amended claims 8 and 19-22 are also allowable over the cited references. Since claims 3-4, 10-11, 13-14, and 18 depend variously from claims 1 and 8, the Applicant submits that those claims are also allowable over the cited references.

Claim 18

Although the Examiner stated, in paragraph 6, that claim 18 was rejected under 103(a), there is no discussion of claim 18 in the office action. The Applicant requests clarification of the grounds for rejecting claim 18.

New Claims 67, 76, 85, and 94

New claim 67 is directed to a method for remotely performing a hearing test on a user of a hearing aid via a telephone system. According to this method, a command is transmitted from a remote computer over the telephone system to a telephone of the user. The telephone renders the command as a sound signal. The hearing aid receives the sound signal, a signal processor in the hearing aid generates a test signal based on the sound signal, and the hearing aid generates a test tone based on the test signal. A user response to the test tone is transmitted to the remote computer, which generates hearing test results for the user of the hearing aid based on the user response.

Fig. 4 represents an exemplary implementation of this method. One of the significant advantages of certain embodiments of this invention is that, other than the hearing aid itself, the user (i.e., the wearer of the hearing aid) does not have to have any specialized local equipment. In particular, the method of claim 67 can be implemented by the user using a conventional telephone. As such, the invention of claim 67 allows users of hearing aids to have their hearing tested from any location, such as their homes, without having to visit a hearing health professional in person and without having to control any specialized local equipment.

The Applicant submits that the invention of claim 67 is allowable over the references cited by the Examiner to reject the previously pending claims.

For example, Platt teaches a method for programming a conventional hearing aid at a remote location. As taught in Platt, the remote location corresponds to the location of a hearing health professional (see column 9, lines 4-8), who operates specialized local equipment to perform the method. In particular, implementation of Platt's method requires a local interface unit (e.g., 20 of Fig. 1) and local modem (e.g., 22) in addition to the user's hearing aid (e.g., 30).

Moreover, in Platt, the hearing test is performed locally by a hearing health professional (see column 9, lines 4-8); only the calculations of the auditory parameters are performed at the remote central office. See column 9, lines 35-43. Thus, Platt does not teach or even suggest a method whereby the hearing test itself is performed using a remote computer.

Lindemann teaches a hearing aid with *in situ* testing capability. In particular, Lindemann teaches a hearing aid with a built in or internal test tone generator for providing test tones for diagnostic tests to a user of the hearing aid. See, e.g., Abstract.

Lindemann teaches two different types of hearing aids: hearing aid 100 of Fig. 1 and digital hearing aid 200 of Fig. 2.

Hearing aid 100 supports three different sources of signals for its diagnostic tests: input port 110, test tone generator 108, and memory 106. Since the signals from memory 106 are applied to D/A converter 107, the signals applied to switch 120 from D/A converter 107 are analog electrical signals. Since switch 120 selectively forwards signals received from any of input port 110, test tone generator

108, and D/A converter 107 to switch 112, the test tones received at input port 110 are undoubtedly also analog electrical signals.

Hearing aid 200 of Fig. 2 supports four different sources of signals for its diagnostic tests: digital input port 208, analog input port 209, test tone generator 214, and memory 220, where the signals received at digital input port 208 are digital electrical signals, and the signals received at analog input port 209 are analog electrical signals.

The only sound signals received by Lindemann's hearing aids are the ambient sound signals received at microphones 102 and 202, which have nothing to do with Lindemann's diagnostic tests. See, e.g., column 3, lines 49-64.

Significantly, Lindemann does not teach or even suggest a hearing test method, where the hearing aid receives sound signals from a telephone, where the sound signals correspond to commands transmitted from a remote computer to the telephone over a telephone system, where those sound signals are then used by the hearing aid to generate the test tones for the hearing test. Significantly, according to Lindemann, the signals received at input ports 110, 208, and 209 are electrical signals, not sound signals. Moreover, in Figs. 1 and 2, Lindemann explicitly shows other "control signals" being applied to hearing aids 100 and 200.

Furthermore, although Lindemann does not adequately describe the rest of the diagnostic testing system, since all of the signals applied to hearing aids 100 and 200 are either analog or digital electrical signals (rather than the sound signals of the present invention), there must be some other specialized equipment, such as a local computer, configured to the hearing aids to provide those electrical signals.

In addition, Lindemann explicitly teaches that the diagnostic test is orchestrated by a "hearing aid fitter," who presumably is operating the specialized equipment for the "subject." See column 4, lines 60-67. Thus, there is nothing remote about the diagnostic testing in Lindemann; the subject is co-located with the hearing aid fitter, who records the subjects responses to generate an audiogram.

Nowhere does Lindemann teach or even suggest the use of a conventional telephone system to transmit commands from a remote computer to a telephone, where the telephone renders the commands as sound signals that are received and used by a hearing aid to generate test tones for a user of the hearing aid.

Rho teaches a method for testing hearing remotely over a conventional telephone system, but Rho does not teach anything about hearing aids.

Besserman also teaches a system for remote hearing tests, but, like Rho, Besserman does not teach anything about hearing aids.

Significantly, none of the cited references, whether considered individually or in any combination, teaches or even suggests a hearing aid with the capabilities recited in claim 67. Nor do they teach or even suggest the advantages enabled by the present invention. In particular, none of the cited references teaches technology that can support remote performance of a hearing test on a user of a hearing aid via a conventional telephone system using a conventional telephone that does not require any specialized local equipment other than the hearing aid itself.

For all these reasons, the Applicant submits that new claim 67 is allowable over the cited references. For similar reasons, the Applicant submits that new claims 76, 85, and 94 are allowable.

Since claims 68-75, 77-84, 86-93, and 95-102 depend variously from claims 67, 76, 85, and 94, it is further submitted that those claims are also allowable.

Claims 68, 77, 86, and 95

According to new claims 68, 77, 86, and 95, the command is a DTMF signal, the sound signal is a DTMF tone, the test signal is different from the DTMF signal, and the test tone is different from the DTMF tone. Note that the DTMF tone is rendered by the telephone for receipt by the hearing aid as a sound signal.

For the same reasons presented earlier for claims 1, 8, and 19-22, the Applicant submits that these provide additional reasons for the allowability of claims 68, 77, 86, and 95 over the cited references.

Claims 71, 80, 89, and 98

According to new claim 69, the remote computer generates adjustments for the hearing aid based on the hearing test results and transmits the adjustments to the hearing aid to adjust operations of the hearing aid. According to new claim 71, which depends from claim 69, the adjustments are transmitted from the remote computer to the telephone via the telephone system, and the adjustments are transmitted from the telephone to the hearing aid as sound signals.

None of the cited references teaches or even suggest transmitting adjustments to a hearing aid as sound signals using a conventional telephone system. As such, the Applicant submits that this provides additional reasons for the allowability of claims 71, 80, 89, and 98 (and therefore claims 72, 81, 90, and 99 as well) over the cited references.

Claims 72, 81, 90, and 99

According to new claims 72, 81, 90, and 99, the adjustments are DTMF signals, and the sound signals corresponding to the adjustments are DTMF tones. For the same reasons given previously for claims 1, 8, and 19-22, the Applicant submits that these are additional reasons for the allowability of claims 72, 81, 90, and 99 over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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